Application No. 10/032,861

Amendment dated: February 25, 2004

Reply to Office Action of: November 25, 2003

Amendments to the Specification:

Please replace the paragraph, beginning at page 1, line 26, with the following rewritten paragraph:

In the circuit protectors of the above structure, the heat expected to concentrate to the narrowed portion easily diffuses through the substrate, since alumina substrate has a high thermal conduction coefficient. The heat escapes to wiring of a circuit board through terminals of a circuit protector. As a result, fusing characteristics of a circuit protector tends to fluctuate depending <u>on</u> various conditions such as wiring arrangement in the relevant circuit board, etc.

Please replace the paragraph, beginning at page 3, line 5, with the following rewritten paragraph:

FIGS. 2A <u>and 2B is a are explanatory views</u> showing [[a]] heat diffusion in [[a]] circuit protectors in accordance [[of]]<u>with</u> the present invention.

Please replace the paragraph, beginning at page 5, line 7, with the following rewritten paragraph:

Referring to FIG. 1, a substrate 11 (see also Figs. 9 and 10) is made of an insulating material by a press molding, extrusion or the like process. A conductive layer 12 is formed on the substrate 11 using a printing, coating or plating method, or sputtering or other vacuum deposition process. A groove 13 is formed in the conductive layer 12 by irradiating a laser beam, or by a mechanical method using a grindstone. A protection material 14 is applied to cover an area of substrate 11 and conductive layer 12 where the groove 13 is provided. Ends 11b, 11c respectively represent terminal electrodes provided at both ends of the substrate 11. A state of the conductive layer provided with the groove 13 is shown in detail in FIGs. 3(b)(a) - 3(c).

Please replace the paragraph, beginning at page 5, line 17, with the following rewritten paragraph:

A narrowed portion 13a is provided at a part of the conductive layer 12, and is disposed in an vicinity of an area restricted by the two ends of continuous groove 13. A circuit protector of the present invention controls the fusing current at the narrowed portion

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13a by defining at least one item among the width of narrowed portion 13a and the layer thickness of conductive layer 12. It is manufactured based on specifications obtained and established through experiments with respect to such elements as the material for substrate 11, the material and layer thickness of conductive layer 12, and the width of narrowed portion 13a, so that the narrowed portion 13a melts when a 5A current flows between the ends 11b and 11c. When an electric current of a certain specific value (e. g. 5A) flows between the terminals 15 and 16 (see Figs. 1 and 9), the narrowed portion 13a melts down; thereby, the circuit protector protects a circuit board or the like (in the following recited as "board") or an electronic apparatus from getting damaged.

Please replace the paragraph, beginning at page 6, line 2, with the following rewritten paragraph:

The grooves 13b and 13c are disposed between the narrowed portion 13a and the end 11b, and between the narrowed portion 13a and the end 11c, respectively. Referring to FIG. 1, the grooves 13b and 13c are formed on a face 100 and the next faces 101, 103 of the substrate 11; but not on the face 102, which is a face opposing to the face on which the narrowed portion 13a is disposed. The groove 13b is illustrated in detail in FIGs.FIG. 3 (b) and 3(c). By providing the grooves 13b, 13c, a time needed for the narrowed portion 13a to melt down can be made shorter and deviation in the characteristic can be made narrower, when an electric current in excess of a rated value flows and excess heat is generated. This is because the grooves prevent the heat from diffusing towards the ends 11b, 11c, and the concentrated heat surely break the conductive layer 12 at the narrowed portion 13a.

Please replace the paragraph, beginning at page 16, line 13, with the following rewritten paragraph:

The grooves 13b, 13c reduces diffusion of the heat generated at the narrowed portion 13a towards the terminals 15, 16 via the conductive layer. When such a circuit protector is mounted on a board, diffusion of the heat to the board via terminals 15, 16 can be reduced, as a result the pre-arcing time can be shortened. A heat diffusion in the conductive layer 12 is shown in FIG. 2A. <u>In FIG. 2B, the heat diffusion is shown but without grooves 13b, 13c.</u> The arrows in FIGS. 2A, 2B indicate the route of heat diffusion.